6.0 Process Management

6.1 Management of Product and Service Processes
6.1a Design process

6.1a(1) Product/delivery processes and design Fig. 6.1-1 shows our work design process. First we define customer requirements in MOA's or PMP's. MOA's are used to define roles and responsibilities of each agency (HNC, customers, partners, suppliers, etc.) for projects. PMP's are formal plans required for all projects over $100K. Based on the customer requirements outlined in these plans, project managers (PM's) define in their business action plans (2.2) the resources required to support new or expanded work. The MCG reviews the needed resources; then an integrated process team (IPT) (5.1a(1)) of cross-functional personnel from our key processes and support processes is formed to take work from design to execution. IPT's define the following aspects of our products and services and their delivery through the PMP: resource plan, outline of needed key and support processes, acquisition plan, baseline schedule, SOW based on customer requirements, process specifications, technology requirements, performance measures, configuration (change) management plan, program/data quality control plans (PQCP's/DQCP's).

If no design changes are required, IPT's manage the processes to produce and deliver the product or service.

6.1a(2) Incorporating changing requirements We identify new or changing requirements through the approaches in item 3.1 and tables 3.1-2 and -4. We include requirements in formal design and production reviews as shown in figs. 3.1-1 and 6.1-1. We also use cross-functional subject matter expert reviews to identify changing specifications and/or regulatory requirements. In-progress changes are integrated through formal configuration management procedures and IPT's on complex projects. When formal configuration management is not appropriate, PMP's, QC plans, and SOW's provide the means to actively modify the design/delivery process to incorporate changes during project design execution. Frequent IPT meetings and regular communication with the customer provide the rapid response and flexibility required by smaller and short-term projects.

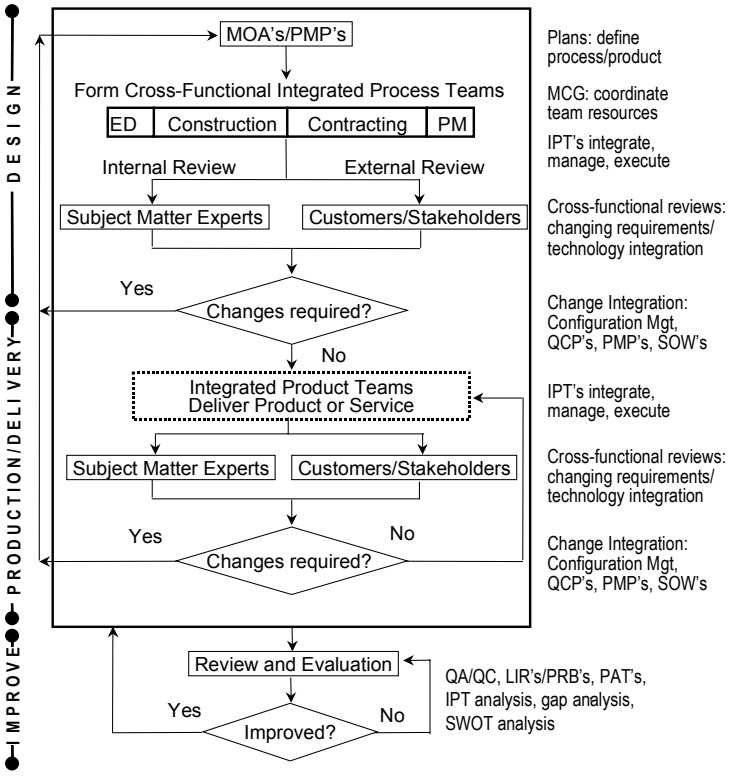


Figure 6.1-1. Product/Service Process Model

6.1a(3) Incorporation of new technology Many products and services are unique engineering systems requiring a first-time approach or technology introduced in evolving regulatory environments. To stay innovative and keep up with changes, we use four main approaches:

- *Market knowledge*. We remain current with ever-changing and new technologies by participating in DOD and industry forums, working groups, and regulatory committees as explained in 3.1a(2).
- *Project startup*. When possible, we introduce new technologies at the front end of the project. The most efficient way to do this is by evaluating new technologies and/or approaches during acquisition planning to minimize changes during execution. Suppliers, then, propose and/or demonstrate new technologies and/or approaches as part of their evaluation. Recent acquisition plans from OE and OMEE Programs were recognized by Corps HQ for their innovative approaches and submitted to Corps districts as models for other acquisitions.
- *Technology team*. For continual technology advancement, we use an innovative technology team that continually reviews and evaluates new technologies and their applicability to our work. One such team established a demonstration test site to evaluate applicable technologies for simulating OE contamination. Vendors may use that test site to improve and demonstrate their innovations.
- *During execution*. New or changing technologies are also integrated into our products/processes at later stages through formal configuration management control procedures and modifications to the design/delivery process through PQCP's, DQCP's, and SOW's.

6.1a(4),(5) Addressing process efficiency/effectiveness factors and performance requirements As explained in 5.1a(1), we integrate all elements of product/service design through cross-functional IPT's as shown in fig. 6.1-3. To ensure compliance with technical and regulatory requirements and consistency between similar

products/services, subject matter experts review the design, e.g., an HNC board reviews all OE engineering evaluation recommendations from various IPT's for consistency from team to team before external review.

To further assist IPT's, we perform in-process reviews (IPR's) of all QC plans, which document initial customer requirements defined by MOA's/PMP's and revised criteria and rationale for change. We also use internal quality assurance (QA) audits to evaluate and improve our design processes. We develop QC plans for all projects. As those documents are audited, results are fed back into the QA process to promote transfer of learning and reduce cycle time. To enhance learning and technology transfer, audit team members are selected from other product teams. Audit information is shared through IPT meetings, LIR's/PRB's, and websites.

6.1a(6) Coordination and testing We coordinate and test our design and production/delivery processes through internal reviews by subject matter experts and external reviews by customers and stakeholders as shown in fig. 6.1-1. When appropriate, we use small-scale pilot tests before full product application. On our Chem Demil Program, a pilot plant was built at program start. On our BMD Program, we will also design and construct test facilities prior to full-scale production.

6.1b Production/delivery processes

6.1b(1), (2), (3) Key processes, requirements, management, and operations We deliver a diverse family of technical products and services through the Project Management Business Process (PMBP). Methodology. Our four key processes are:

- Engineering and technical services provide product line design, technical support, and QA.
- Construction management provides construction management, field QA, and change management.
- Contract management provides pre- and post-award acquisition services.
- Program and project management (P&PM) integrates key and support processes, ensuring that the final product meets the customer's needs.

Our PMBP in fig. 6.1-3 identifies product lines, key process requirements, controls for ensuring that requirements are met, and measures for controlling our processes. At 1.0, corporate process controls are the highest level controls, ensuring that process systems are effective and efficient. At 2.0, product lines are developed to align customer requirements with specific processes. At 3.0, project controls are used by IPT's to ensure that processes meet specific customer requirements. At 4.0 and 5.0, processes are integrated to support product lines.

6.1b(2) Key process operations performance Process management begins at strategic planning where KSF strategies are developed. Teams then develop business plans, including operational strategies and measures supporting corporate strategies in table 2.2-1. Daily operations are monitored through the measures in fig. 6.1-3 at team meetings and LIR's. Aggregated measures of process performance are reviewed by leaders during Business Meetings and PRB's (1.1b(1)).

6.1b(3) Process performance measures Our key performance measures and the controls used to manage and improve our processes are identified in fig. 6.1-3. Real-time customer input is sought as described in table 3.1-2 and fig. 3.1-1 and reported in fig. 7.1-11.

6.1b(4) Improving and sharing lessons learned Mechanisms for improving our processes are as follows:

- *Integrated Process Teams.* Our IPT's are cross-functional teams integrating and executing our processes daily, and are, therefore, a key improvement source. Our Energy and Medical Teams, for example, developed a streamlined process for O&M repair and renewal (figs. 7.5-1 thru -4), which is deployed in four ways: (1) We partner with districts to provide O&M repairs for their customers through our established contracts. (2) Districts are adopting our process as their own business practice. (3) We provide service to the Army and Air Force Medical customer. (4) Aspects of this process and its concepts have been adapted and adopted by other teams, such as OE.
- *QA Audits*. Through our quality audit process, we develop QCP's for all projects. Internal ISO 9000-trained teams audit those projects to streamline processes, evaluate quality, prevent deficiencies, and create a mechanism for continuous improvement (fig. 6.1-2).

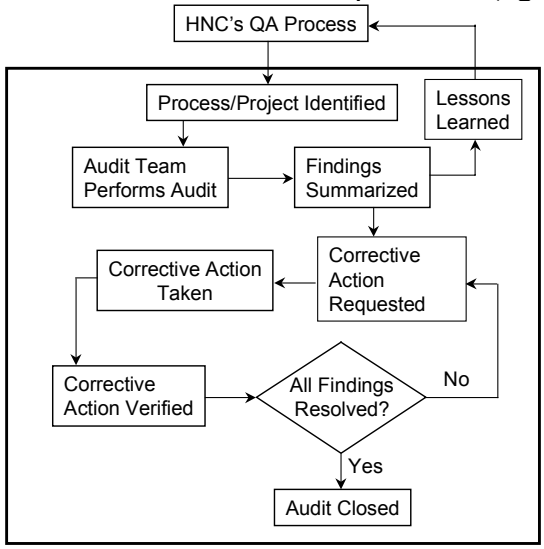
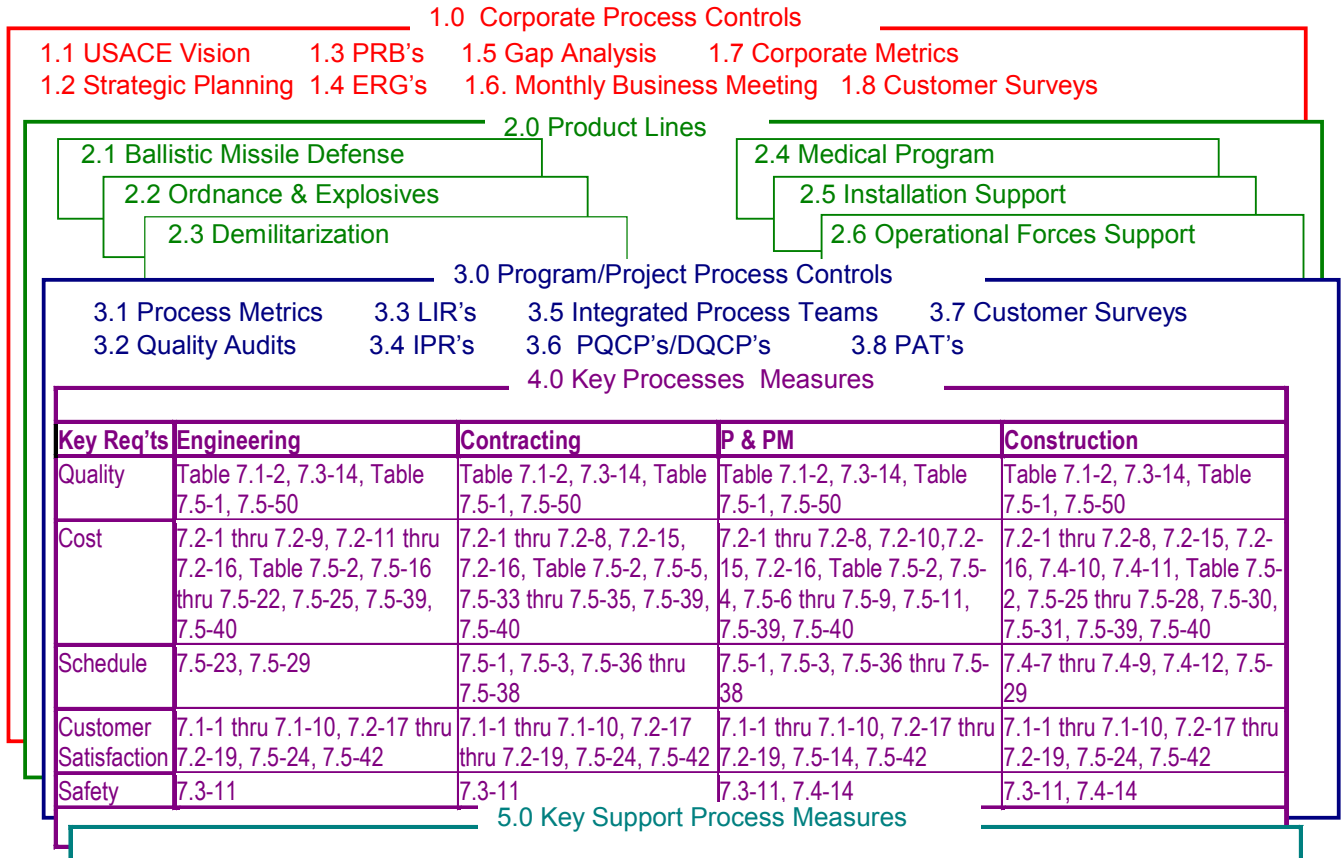


Figure 6.1-2. Quality Audit Process



Key Req'ts	Engineering	Contracting	P & PM	Construction
Quality	Table 7.1-2, 7.3-14, Table 7.5-1, 7.5-50	Table 7.1-2, 7.3-14, Table 7.5-1, 7.5-50	Table 7.1-2, 7.3-14, Table 7.5-1, 7.5-50	Table 7.1-2, 7.3-14, Table 7.5-1, 7.5-50
Cost	7.2-1 thru 7.2-9, 7.2-11 thru 7.2-16, Table 7.5-2, 7.5-16 thru 7.5-22, 7.5-25, 7.5-39, 7.5-40	7.2-1 thru 7.2-8, 7.2-15, 7.2-16, Table 7.5-2, 7.5-5, 7.5-33 thru 7.5-35, 7.5-39, 7.5-40	7.2-1 thru 7.2-8, 7.2-10,7.2-15, 7.2-16, Table 7.5-2, 7.5-4, 7.5-6 thru 7.5-9, 7.5-11, 7.5-39, 7.5-40	7.2-1 thru 7.2-8, 7.2-15, 7.2-16, 7.4-10, 7.4-11, Table 7.5-2, 7.5-25 thru 7.5-28, 7.5-30, 7.5-31, 7.5-39, 7.5-40
Schedule	7.5-23, 7.5-29	7.5-1, 7.5-3, 7.5-36 thru 7.5-38	7.5-1, 7.5-3, 7.5-36 thru 7.5-38	7.4-7 thru 7.4-9, 7.4-12, 7.5-29
Customer Satisfaction	7.1-1 thru 7.1-10, 7.2-17 thru 7.2-19, 7.5-24, 7.5-42	7.1-1 thru 7.1-10, 7.2-17 thru 7.2-19, 7.5-24, 7.5-42	7.1-1 thru 7.1-10, 7.2-17 thru 7.2-19, 7.5-14, 7.5-42	7.1-1 thru 7.1-10, 7.2-17 thru 7.2-19, 7.5-24, 7.5-42
Safety	7.3-11	7.3-11	7.3-11, 7.4-14	7.3-11, 7.4-14

5.0 Key Support Process Measures

Key Req'ts	Regulatory & Legal Compliance	Facilities & Equipment Management	Information Management	Resource Management
Quality	7.3-6, 7.3-7, 7.3-12, Table 7.5-1, Table 7.5-4, 7.5-43, 7.5-44, 7.5-45, 7.5-46	7.3-12, Table 7.5-1,	7.3-12, Table 7.5-1, 7.5-46	7.3-12, Table 7.5-1, Table 7.5-4
Cost	Table 7.5-2, Table 7.5-4	Table 7.5-2, Table 7.5-4	Table 7.5-2, Table 7.5-4	Table 7.5-2, Table 7.5-4, 7.5-43
Schedule	7.5-48	7.5-45	7.5-47	7.5-43
Customer Satisfaction	7.5-42	7.5-42	7.5-42	7.5-42
Safety	7.3-11	7.3-11	7.3-11	7.3-11

6.1-3. Project Management Business Process (PMBP) Methodology for designing, integrating, and managing our processes to create products and services that meet specific customer requirements

• *Other Improvement Venues* We also make improvements through process action teams, external quality management reviews conducted by our partners and suppliers, value engineering studies (fig. 7.5-25), and our gap analysis (fig. 1.1-3).

• *Sharing Lessons* Our structure as explained in 5.1a(1) facilitates information sharing. Therefore, lessons from improvement initiatives are shared across the organization through teams: (1) IPT's brief lessons at PRB's. (2) Lessons are also posted the intranet. (3) Because IPT's are cross-functional, employees bring best practices and lessons from IPT's to their functional units for sharing elsewhere. Paragraphs 4.2a(2),(3) and fig. 4.2-1 explain team sharing from the perspective of information analysis links.

6.2 Management of Key Support Processes

6.2a(1) Description of key support processes Table 6.2-1 lists our key support processes and their basic elements. Fig. 6.1-3 shows how they are integrated to support product line production.

6.2a(2), (3), (4) Key support process requirements, design, operations Key requirements and performance measures for support processes are shown in fig. 6.1-3. Key support processes are designed through requirements in MOA's, PMP's, and internal agreements as shown in figure 6.2-1. In that way, support organizations (1) identify customer requirements, (2) create measurement plans with internal customers, (3) establish a baseline survey, (4) develop plans of action for deficiencies. Changes are

integrated into the design as requirements change. Support processes are monitored and evaluated through the measures shown in fig. 6.1-3.

6.2a(5) Improvement and sharing lessons learned In May 1997, we implemented our first internal customer satisfaction survey (fig. 7.5-42) where employees rate support processes on quality, responsiveness, teamwork, performance, and cost. The ratings, plus feedback from written comments, become a source of support service improvement. Support processes are also evaluated and improved through PAT's, our gap analysis (fig. 1.1-3), and work team analysis. Support process lessons learned and best practices can be shared at PRB's and Business Meetings.

6.3 Supplier and partnering processes

6.3a(1) Key suppliers/partners & products/services Table 1 in the Overview lists our major suppliers and partners by product line. Paragraph 9 in the Overview explains our supplier strategy and our Corps partnerships. Our process for managing supplier and partnering relationships is shown in fig. 6.3-1 and explained below in (1), (2), and (3).

Table 6.2-1. Key support processes and functions

Key Support Process	Process Elements	Principal Function
Regulatory & Legal Compliance	OC, AO, SO, SL, RM-M, EEO, PAO	Ensure that we play by the rules and protect public safety.
Facilities & Equipment Management	LM Directorate	Ensure smooth day-to-day operation of facilities.
Communications & Information Management	IM Directorate	Ensure smooth day-to-day operation of automated systems.
Resource Management	RM Directorate	Ensure fiscal integrity. Calculate accurate manpower requirements.

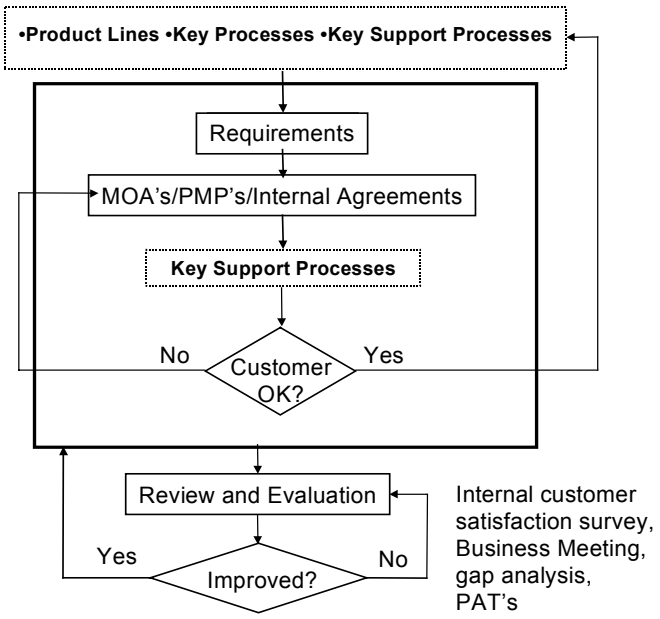


Figure 6.2-1. Key support process design and operations

6.3a(2) Supplier/partner management

• *Supplier process design, selection, and key requirements.* First, we develop an acquisition plan based on customer needs and our key process capabilities, as shown in fig. 6.3-1. That plan outlines the acquisition process, including contract type. Key supplier requirements are then defined in the Commerce Business Daily (CBD) and the statement of work (SOW). The supplier is selected through cost and/or technical competition, with supplier capabilities determined by a contract review board (CRB) and a technical evaluation board (TEB). Contracting Officers use "Best Value" contracting practices to evaluate cost, technical, and past performance when selecting suppliers.

• *Partnering process design, partner selection, and key requirements.* Partners may be customers, contractors, Corps agencies, stakeholders, or other government organizations that are key members of the mission execution team. For all major projects, such as Chem Demil and BMD, we use the Corps of Engineers' formal partnering process per the Chief of Engineers policy memorandum #5 and the IWR PAM-91-ADR-P-4, "Partnering." The Corps process is through facilitated meetings that lead to a charter of mutually beneficial goals signed by the principals, i.e., the customer, suppliers, stakeholders, and the Corps. That partnering process has been recognized as the model for the Government. For smaller projects we use other partnering methods. For example, our Medical team uses quarterly IPR's, and our ESPC team has formal MOA's with installations and Corps districts. As shown in fig. 6.3-1, Corps partnerships are designed through MOA's identifying key requirements.

6.3a(3) Supplier/partner management measures and feedback systems Each contract SOW communicates key quality, cost, schedule, and safety requirements. MOA's and post-award conferences ensure that all participants—Huntsville Center, suppliers, partners, and the customer—understand their responsibilities in meeting expectations. Through our facilitation, customers and suppliers interact regularly. When appropriate, we use full-time liaisons, such as in Aberdeen with our biggest customer, Chem Demil.

Performance feedback is given to each participant during work-in-progress evaluations

conducted via design reviews, QA reports, and IPR's. We also use our quality audits (fig. 6.1-3) to monitor supplier quality, cost, schedule, and regulation compliance. Other evaluation mechanisms include award fee boards (fig. 7.4-66), earned value analysis (figs. 7.4-7, -8, -9), cost and time growth analysis (figs. 7.4-10, -11, -12), and safety surveys (figs. 7.4-14). Performance measures are included in contracts and are evaluated at certain stages during contract execution.

Final supplier performance evaluations and feedback are given at project completion. The performance evaluations are formally documented in databases listed in fig. 4.1-2. Results of those supplier evaluations are reported in figs. 7.4-3, -5, and -6. (There will be no CCASS evaluations until construction for Chem Demil is completed.) Contracts under $100K are evaluated through our Simplified Acquisition evaluation system (fig. 7.4-2).

6.3a(4) Minimizing inspections, tests, and audits

Through Performance Based Contracting (PBC), we reduce the level of effort required for oversight of our suppliers. Without PBC, supplier management requires intense oversight. Under the old approach, we were also responsible for costs incurred because of rework. With PBC, the supplier is responsible for rework required to meet their performance metrics. By incorporating supplier performance metrics directly into contracts, we also place responsibility on the supplier for collecting the data required to evaluate performance.

6.3a(5) Supplier/partner improvement incentives

With the award fee process, we pay the contractor a percent of the total award fee based on supplier performance (fig. 7.4-16). The fee is the only profit the contractor makes. Other incentives include letters/certificates of commendation; excellent ratings; write-ups in HNC publications; project success stories at forums and seminars; posting excellent ratings on our home page; and additional work. Incentives may also be given for special acts or to recognize a supplier's achievement within specific areas, such as a perfect safety record or the application of innovative technologies and/or approaches.

6.3a(6) Improving and sharing lessons learned

Through our gap analysis (fig. 1.1-3), we implemented SSCASS and created and implemented our Simplified Acquisition rating system to better manage and evaluate external supplier performance (figs. 7.4-2 and -3). We have also initiated PBC training for our employees based on improved supplier performance on current contracts utilizing PBC. In addition to team sharing, we share lessons learned and promote technology transfer through standdowns (1.1a(1)), workshops, and partnering. We also participate in industry forums, such as the Joint Advance Planning Briefing for Industry in July 1999.

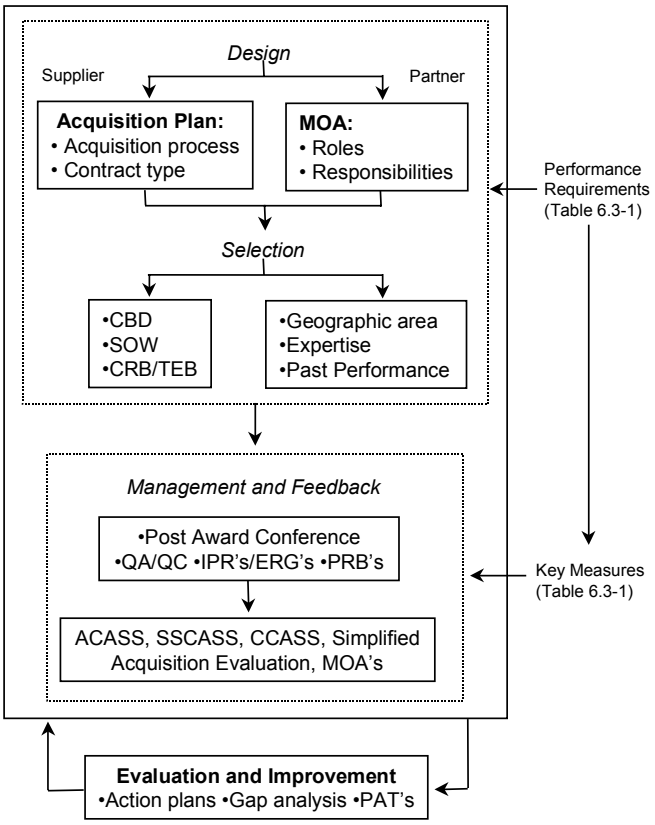


Figure 6.3-1. Supplier and partner management

Table 6.3-1. Supplier and partner performance measures

Key Requirements	Chart References
Quality	7.4-2 thru –6, 7.4-16
Cost	7.4-1, 7.4-7 thru –11, 7.4-13, 7.5-2, -4, table 2 in Overview
Schedule	7.4-7 thru 7.4-9, 7.4-12, 7.4-15
Safety	7.4-14
Customer Satisfaction	7.4-4